Thank you, Mr. Chairman, for the opportunity to testify on the topic of Gulf War illnesses. This afternoon, and in testimony presented to this Committee at prior hearings, other witnesses have summarized evidence indicating that exposure of United States military personnel to acetylcholinesterase inhibitors during the first Gulf War represents a probable contributing factor to Gulf War illnesses. In fact, various of our Gulf War veterans were exposed to three distinct classes of these inhibitors, including chemical warfare agents, pesticides, and pyridostigmine. The Sarin incident which occurred this past month in Bagdad underlines the importance of accelerating efforts to develop therapeutic substances to combat chemical warfare agents and of developing treatments for our military personnel who have already been exposed to such agents. The good news is that we have technology available today to mount a program for the development of such therapeutic substances.

The rationale is as follows: The chemical warfare agents achieve their lethal actions by preventing the breakdown of a substance known as acetylcholine. As a result, in those individuals who are exposed to these agents, there are high levels of acetylcholine in the brain for prolonged periods of time. We now have the technology to determine precisely how acetylcholine modifies nerve cells in the brain. Data already established indicate that acetylcholine can directly affect 17 different proteins in the human brain. We call these proteins acetylcholine receptors. It is possible, using techniques which have already been established, to identify which subset of these 17 receptors is primarily responsible for the toxicity caused by chemical warfare agents. It is also possible to determine precisely how those receptors that are involved produce the toxicity. Elucidation of these mechanisms would immediately permit a search for therapeutic agents. Such agents would have the ability to reverse the chemical changes induced in the brains of Gulf War veterans by these lethal agents. The same research should lead to the development of therapeutic substances that could prevent the lethal effects of these agents in the event of a chemical warfare attack either within the United States or on United States citizens deployed to other regions of the world.

The single major point that I wish to emphasize in this brief presentation is that we now have the technology for a rational approach to treat Gulf War illnesses and to protect our military and civilian population from the consequences of future chemical attacks.